United States Department of Agriculture

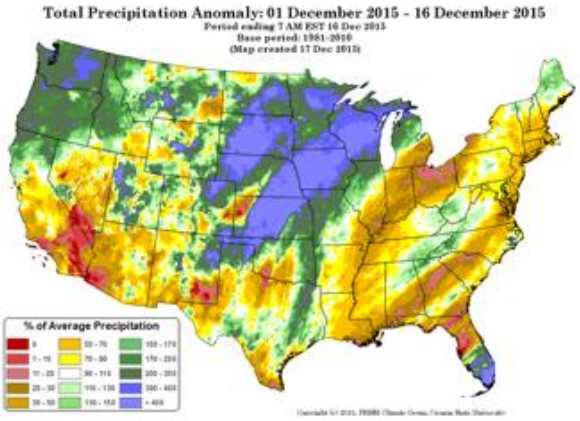
Water and Climate Update

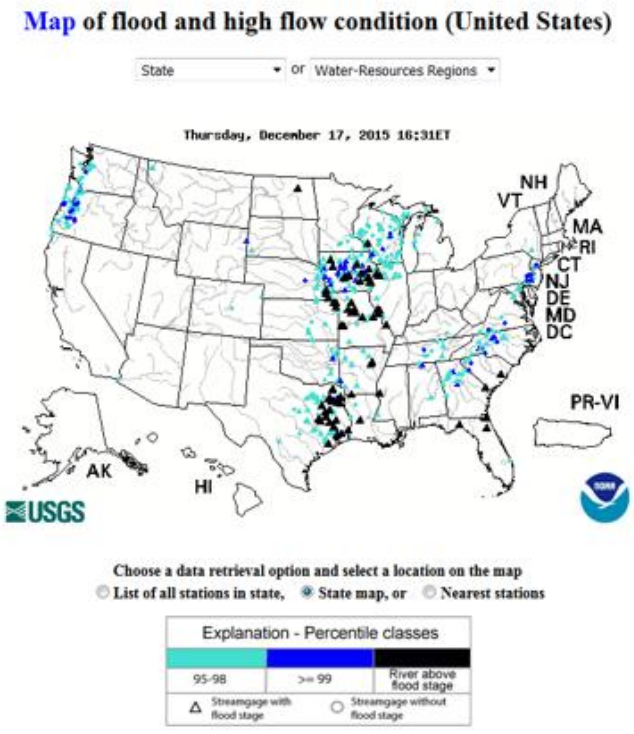
December 17, 2015

The Natural Resources Conservation Service produces this weekly report using data and products from the National Water and Climate Center and other agencies. The report focuses on seasonal snowpack, precipitation, temperature, and drought conditions in the U.S.

Weekly Highlight: Heavy Precipitation in the Midwest causing Widespread Flooding.

For the month of December to date, the national **precipitation percent of average** map shows the largest area of well above average precipitation in the central U.S., southern Florida, and the Pacific Northwest. Refer to the precipitation map on page 7 and the streamflow conditions map on page 14 for links to more information.





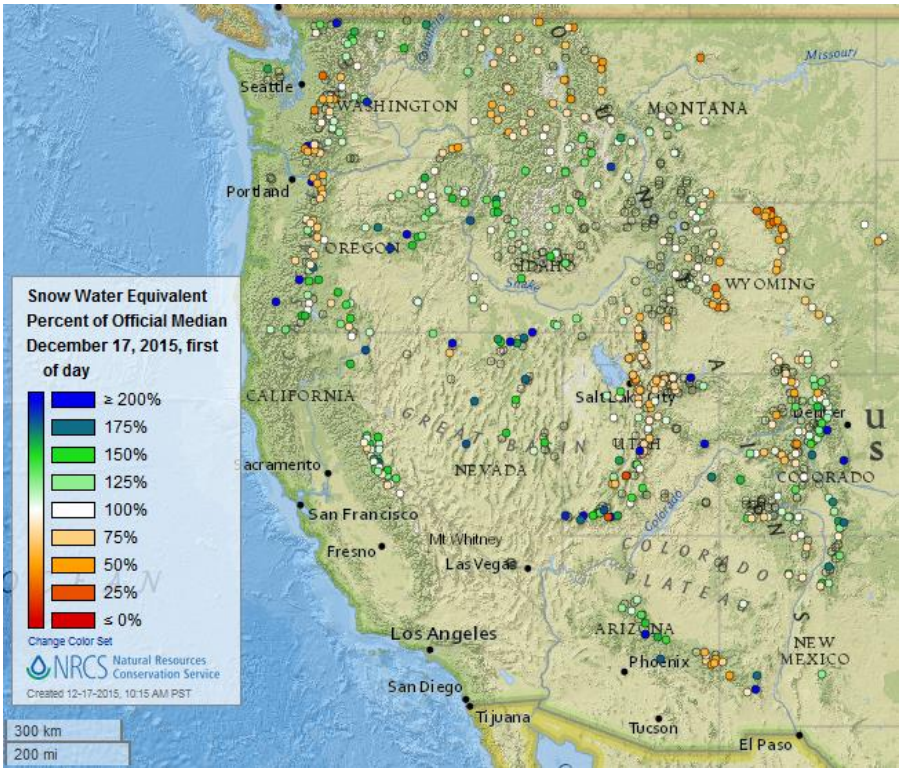
News Stories: **UPDATE: Record rain drenches Iowa pushing river levels higher, closing roads**
Missouri River Projected to Flood in Nebraska City
Rains cause renewed rise in Missouri rivers

Snow

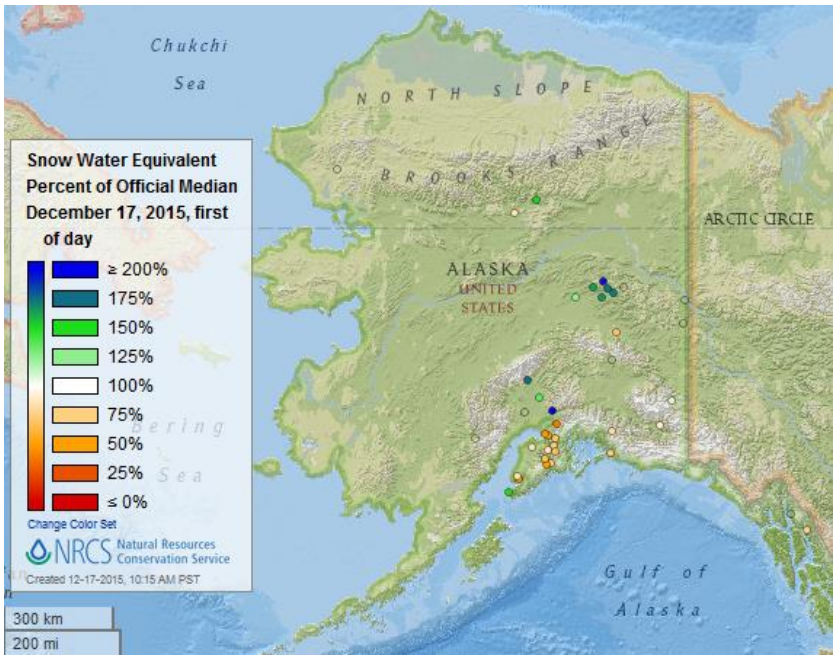
Current Snow Water Equivalent, Western Mountain Sites (NRCS SNOTEL Network)

The current **snow water equivalent percent of median** map shows that the West has a mix of snowpack conditions at this time. Parts of the Pacific Northwest, the Bighorn Mountains of Wyoming, and many stations in the central and northern Rockies have areas of very low snowpack at this time.

Warm and heavy precipitation have reduced the snowpack in the Pacific Northwest, highlighting the contrast to the maps on page 4 which show the precipitation that has occurred recently.

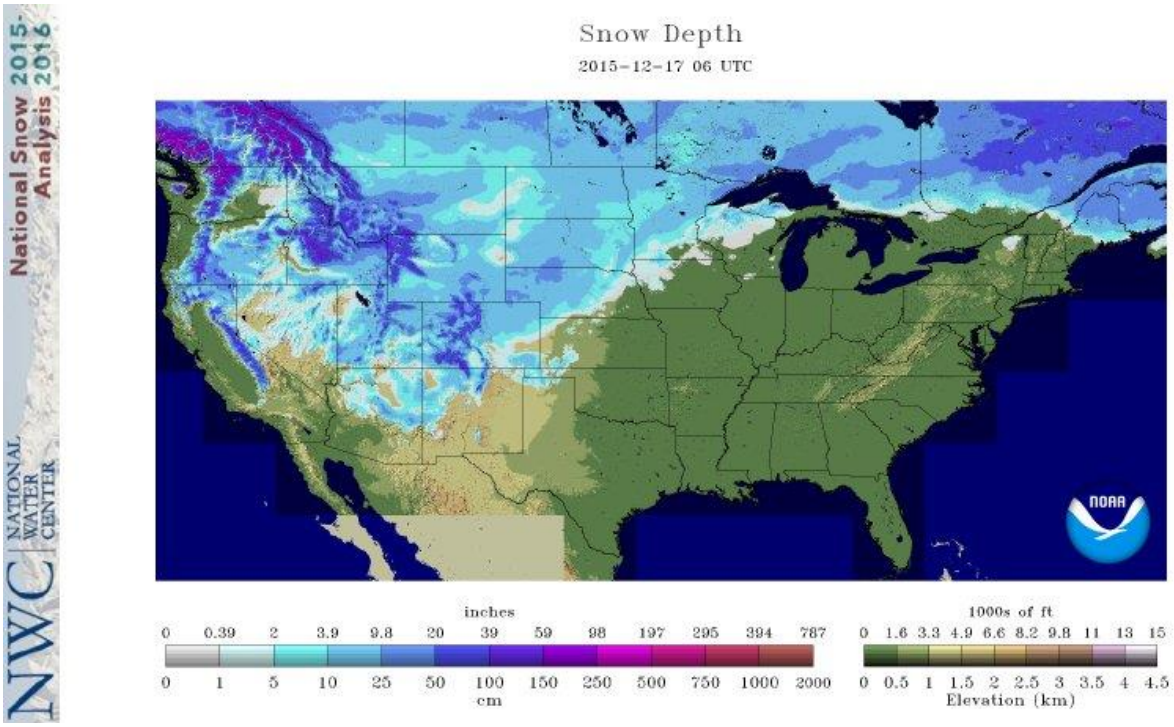


Current Snow Water Equivalent, NRCS SNOTEL Network



The current **snow water equivalent percent of median** map for Alaska shows median to above median snowpack in the Interior and median to below median along the southern part of the state.

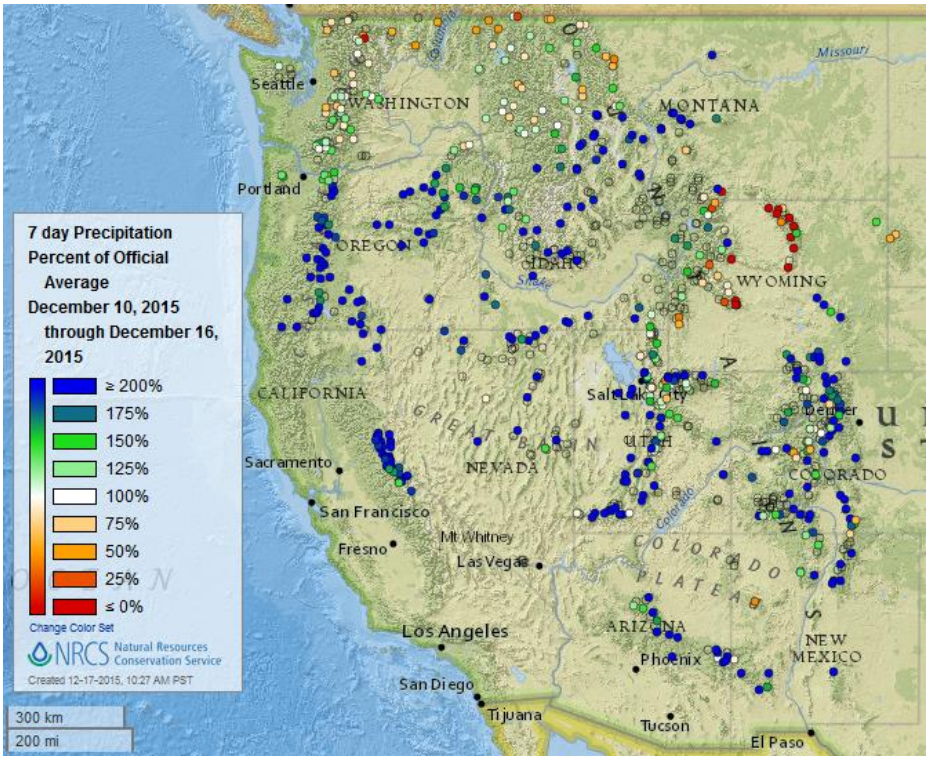
Current Snow Depth, National Weather Service (NWS) Networks



The National Water Center's current **snow depth** map for the continental U.S. shows several areas of significant snow accumulation across from the Pacific Northwest to the southern Rockies and across the Northern Great Plains to the upper Midwest. There is also snowpack increases in much of Maine.

Precipitation

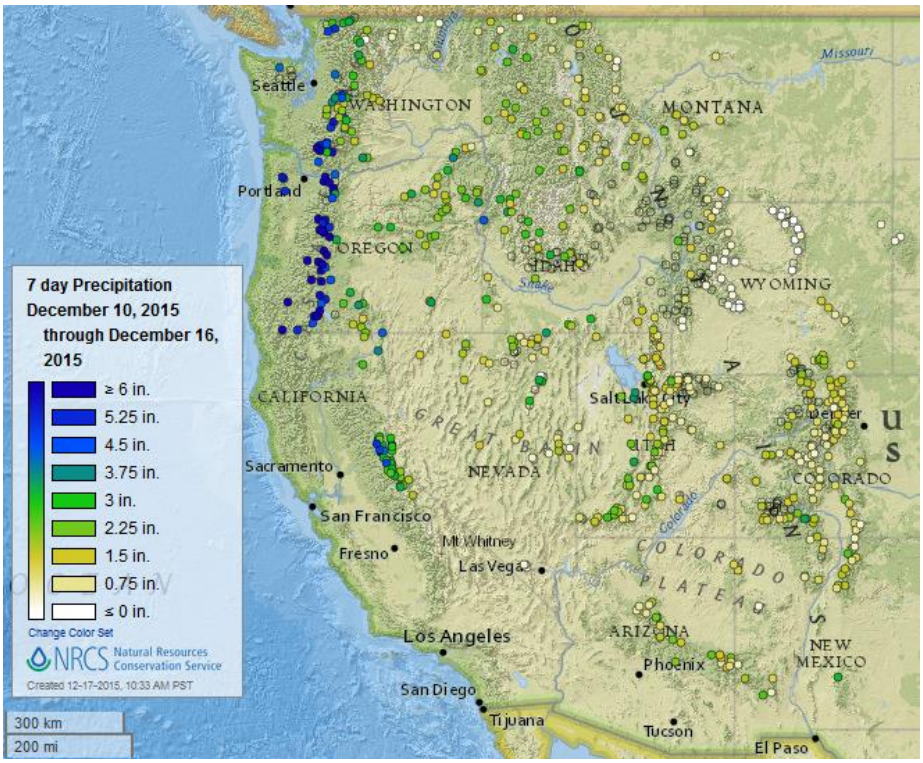
Last 7 Days, Western Mountain Sites (NRCS SNOTEL Network)



The 7-day **precipitation percent of average** map shows that much of the West, has many stations reporting more than 200 percent of average.

Contrastingly, stations in Washington, northern Idaho, and northwest Montana were near average.

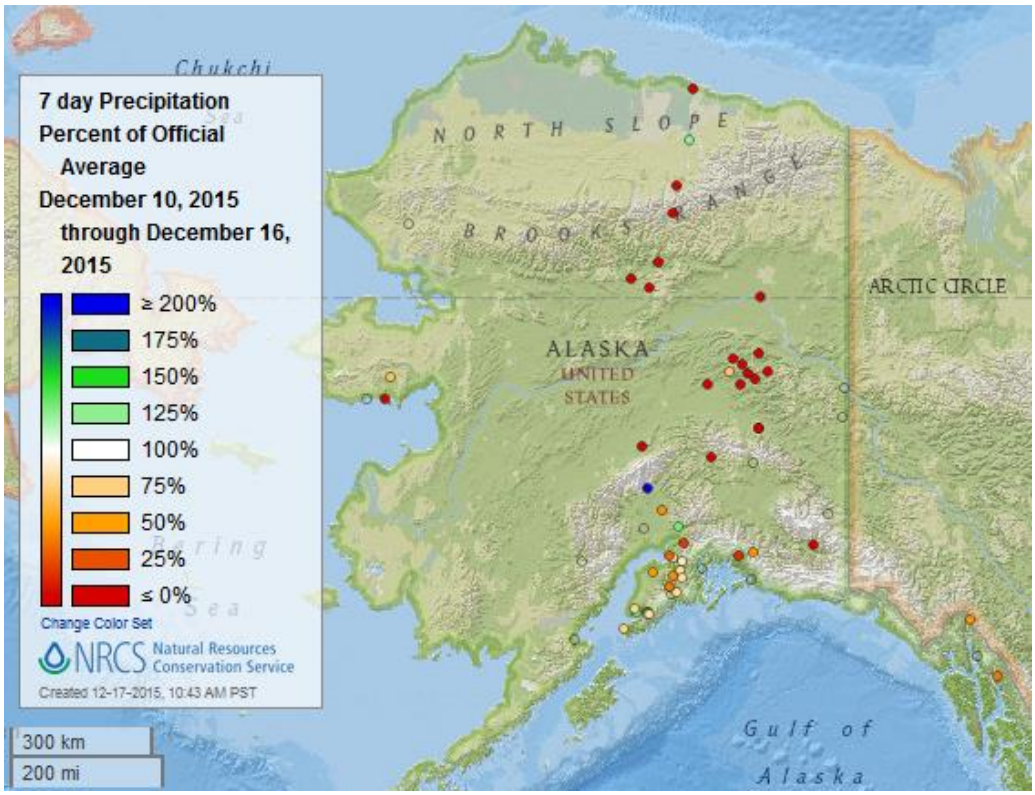
North central Wyoming was much below average for the week, especially in the Big Horn Mountains.



The **total precipitation** map shows over six inches of precipitation fell across the Cascade Mountains of the Pacific Northwest, with lesser amounts elsewhere.

Many stations across the West received nearly 2 inches for the week. Little to no precipitation fell in much of Wyoming.

The Alaska **precipitation percent of average** map for the last seven days shows primarily less than average precipitation across much of the state.



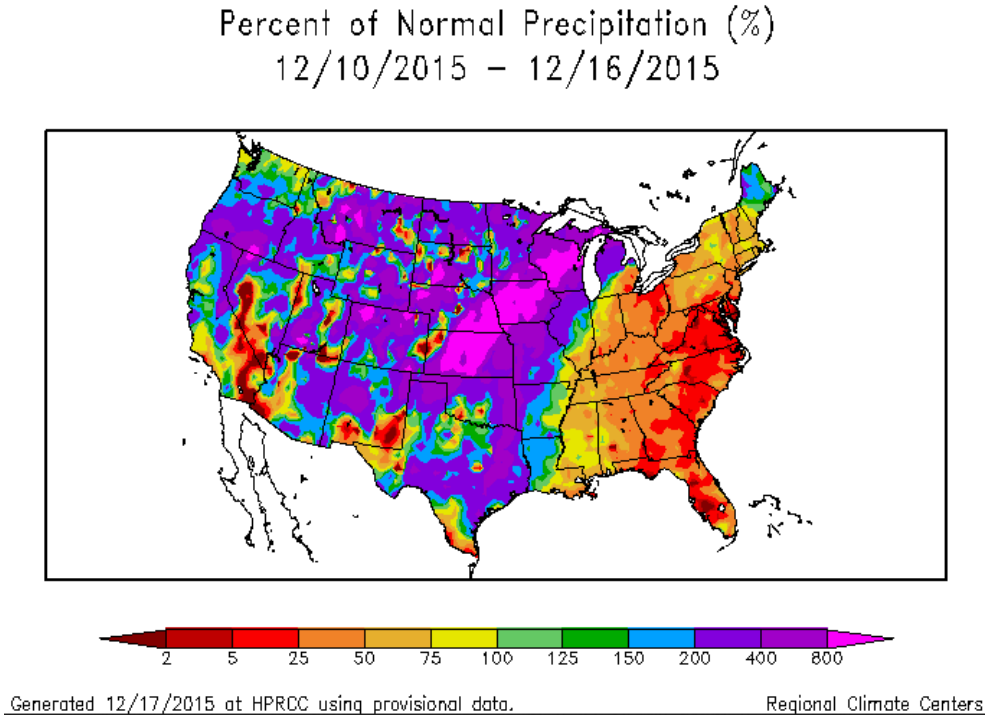
The Alaska seven day **total precipitation** map shows that very little total precipitation fell in much of the state this week Southern Alaska saw less than 2 inches at a few stations along the coast, with the exception of Mt. Eyak which reported 2.5 inches.

Last 7 Days, National Weather Service (NWS) Networks

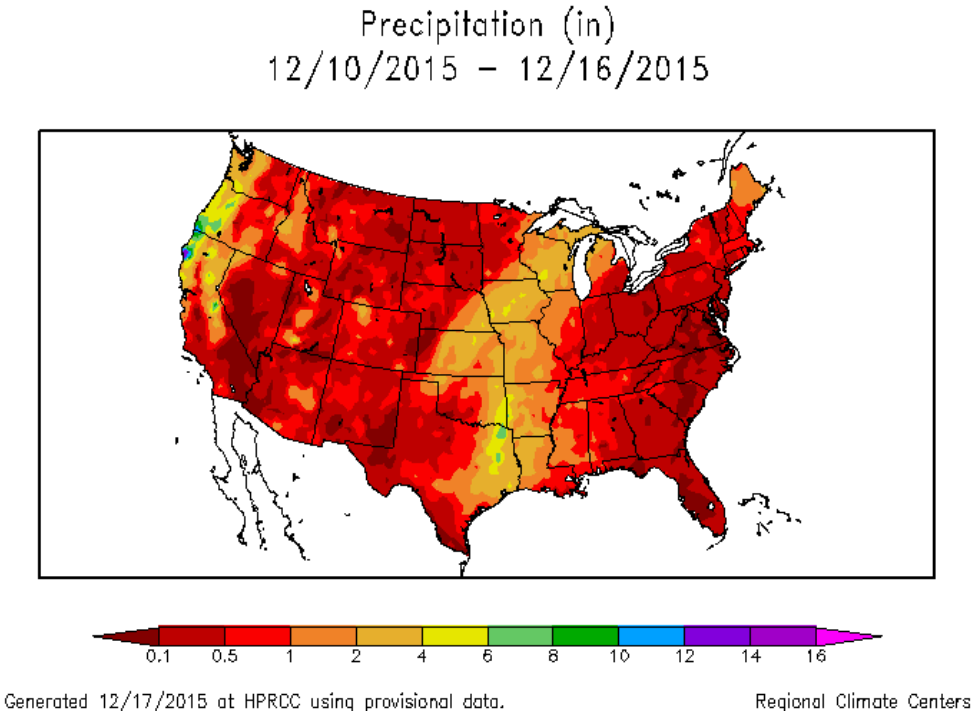
Source: Regional Climate Centers

The **percent of normal precipitation** map shows well above normal precipitation from the Pacific Northwest across much of the West to most of the Mississippi River basin, and in Maine.

Very dry conditions dominated the majority of the eastern third of the country.

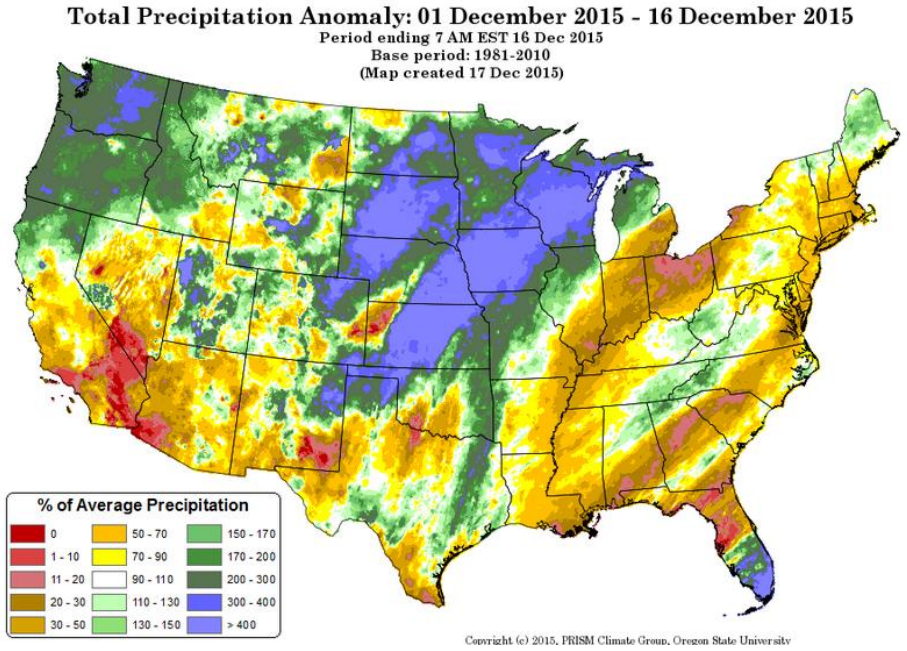


The **7-day total precipitation** map prominently shows the highest amounts of precipitation over 4 inches in the California and Oregon coast, and in the Mississippi River basin. Much of the remainder of the country had less than 1 inch of precipitation or was dry for the week.

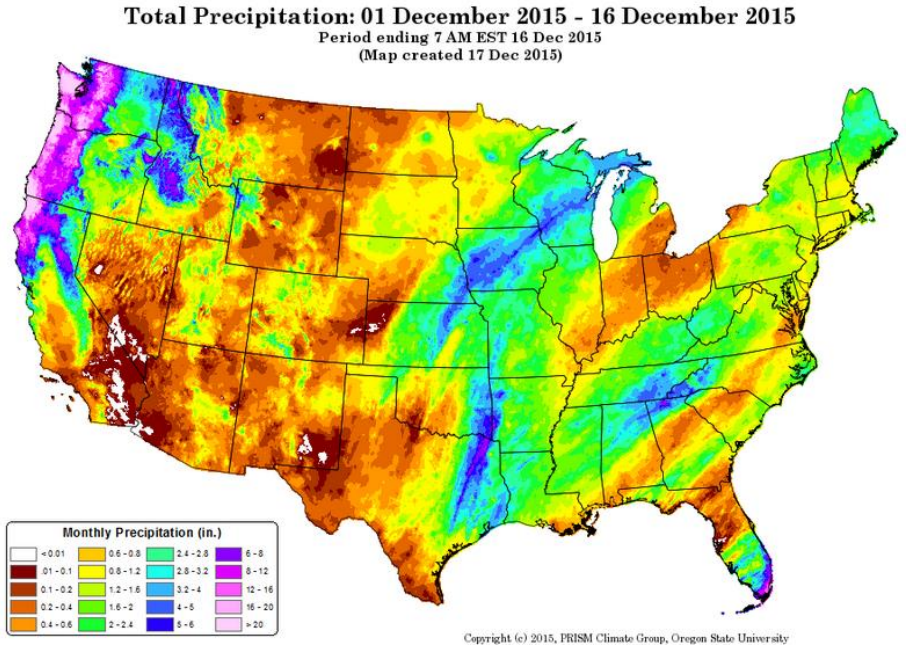


Month-to-Date, All Available Data Including SNOTEL and NWS Networks

Source: PRISM



For the month of December to date, the national **precipitation percent of average** map shows the largest area of well above average precipitation in the central U.S., southern Florida, and the Pacific Northwest. Drier than average areas includes parts of the Southwest, southern California, northern Ohio and the Southeast.

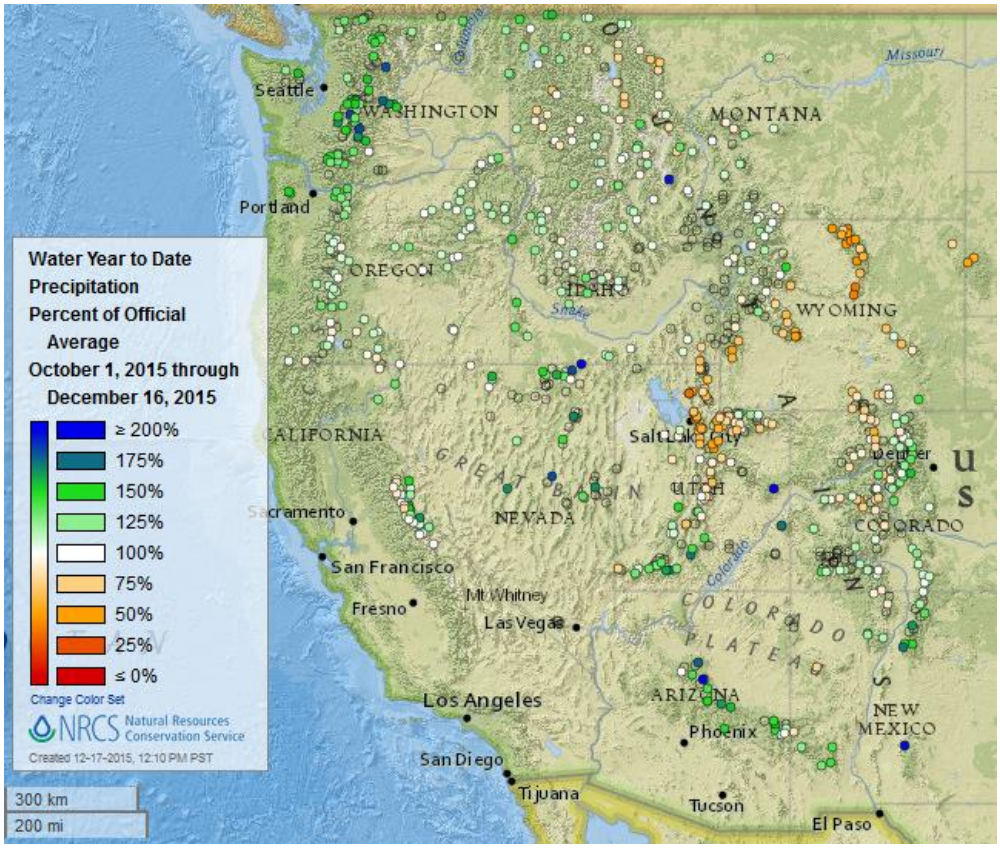


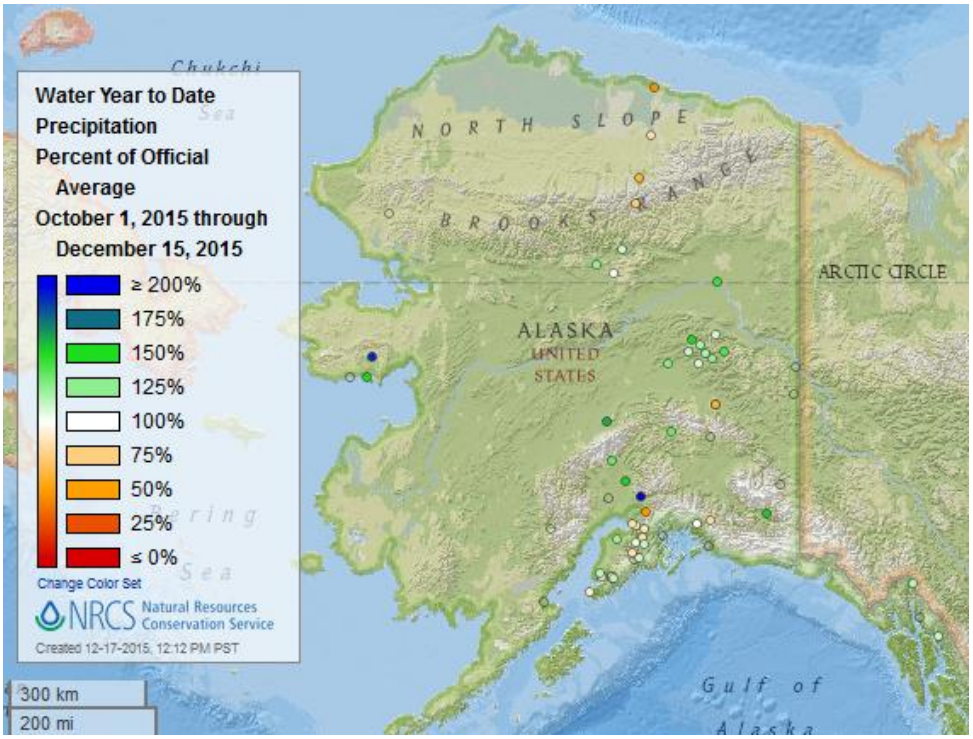
The December month-to-date **total precipitation map** highlights heavy precipitation in the western edge of the Pacific Northwest into northern California, where amounts exceeded 20 inches, and in southern Florida with amounts exceeding 12 inches.

Noticeably dry areas include small areas of southern California, western Great Plains, valleys in the Southwest, Ohio Valley and Southeast.

Water Year-to-Date, Western Mountain Sites (NRCS SNOTEL Network)

For the **2016 Water Year** that began on October 1, 2015, the northern and southern areas are average to above average. In between is a swath of below average areas, going through southern Oregon, southern Idaho, northern Colorado, northern Utah, and much of Wyoming.





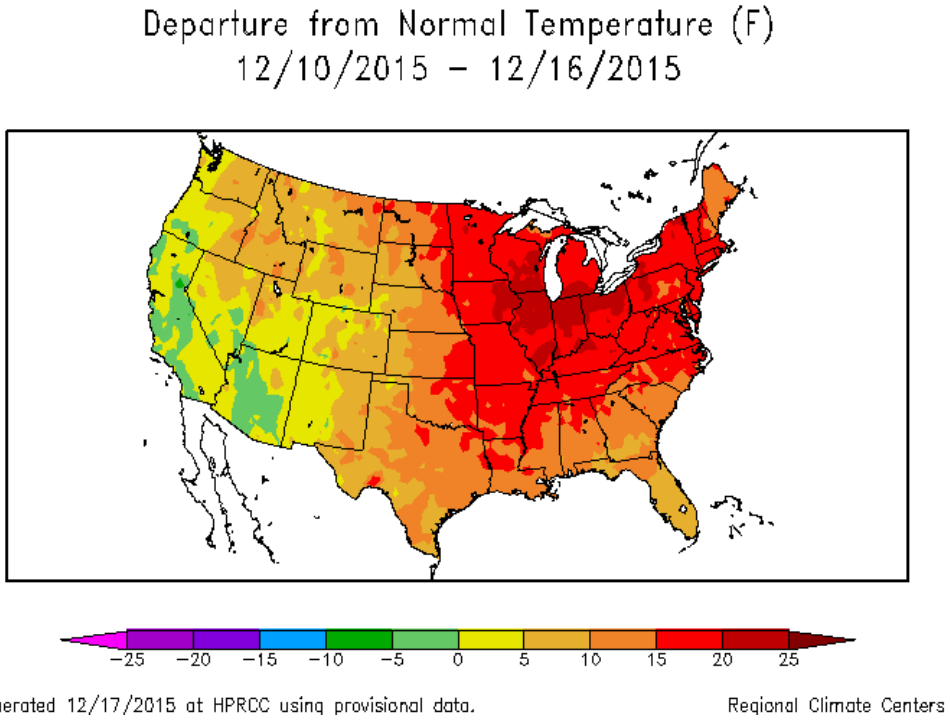
The Alaska water year-to-date **precipitation percent of average** map shows a mix of above, near, and below average sites throughout the state.

Temperature

Last 7 Days, National Weather Service (NWS) Networks

Source: Regional Climate Centers

The map of the **average temperature anomalies** for the past week shows most of the country was warmer than normal for the week, with the central U.S. and Northeast reporting temperatures of over 15 to 20 degrees above normal. The coolest areas of the country were actually near normal temperatures in the West.

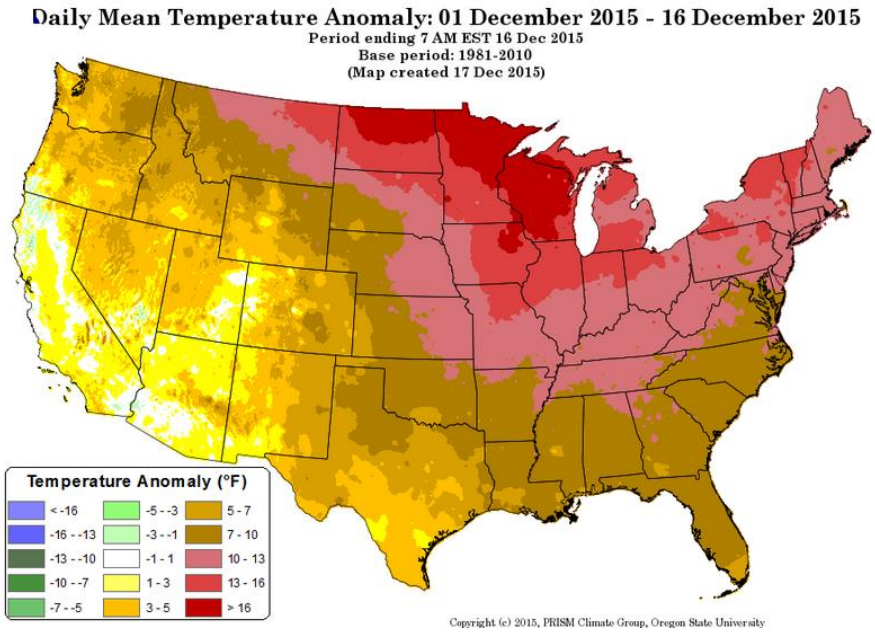


Month-to-Date, All Available Data Including SNOTEL and NWS Networks

Source: PRISM

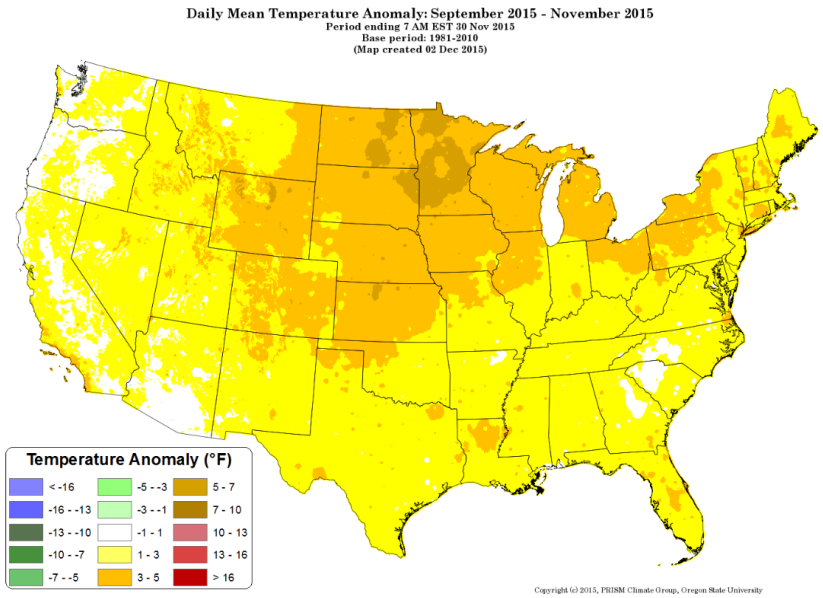
For December 2015, the national **daily mean temperature anomaly** map shows well above normal temperatures in the upper Midwest and northern Great Plains. Most of the remainder of the country was also above normal, to a lesser extent.

The exception to this was in the Southwest, which has areas near normal.



Last 3 Months, All Available Data Including SNOTEL and NWS Networks

Source: PRISM

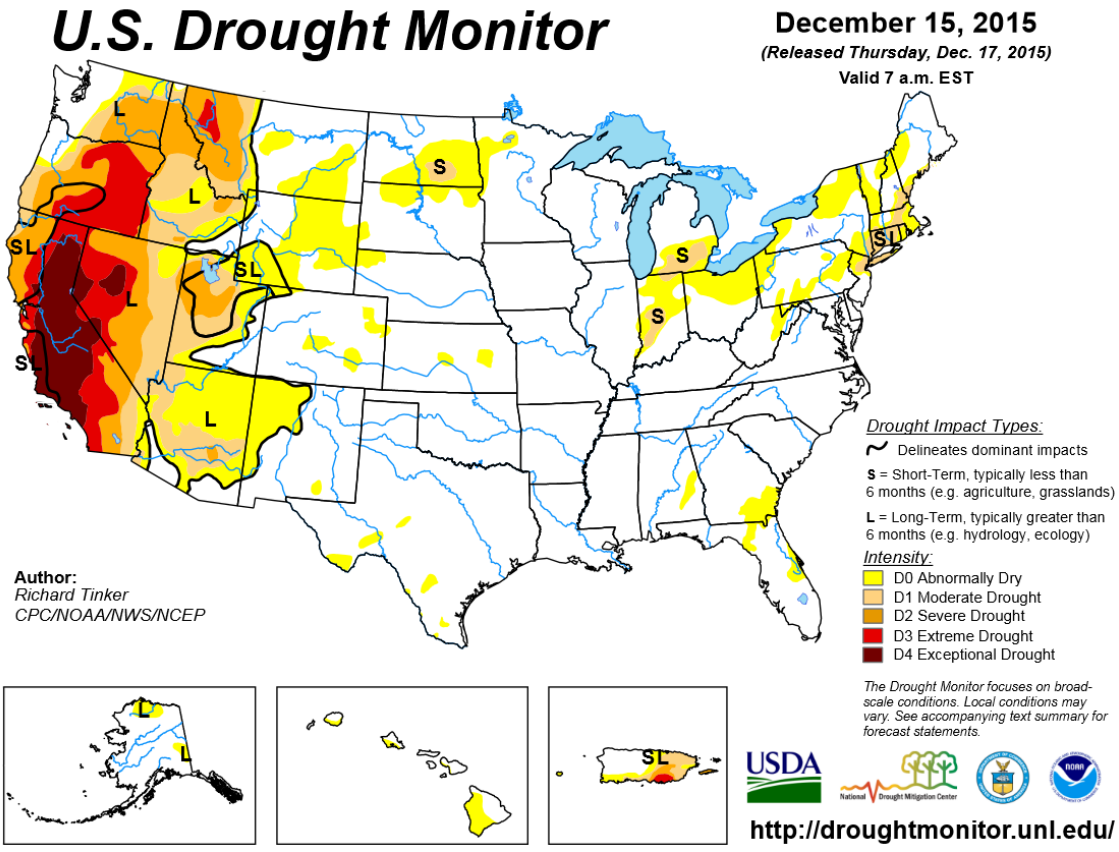


The September through November national **daily mean temperature anomaly** map shows most of the country reporting conditions slightly above average. The largest warm anomaly for the past three months was in the upper Midwest, centered in Minnesota.

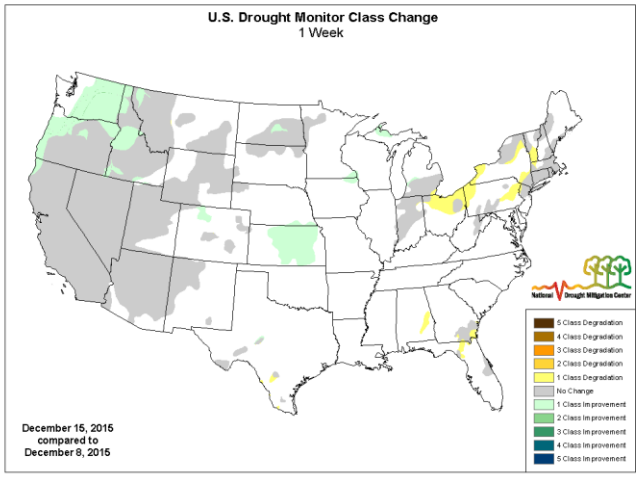
Drought

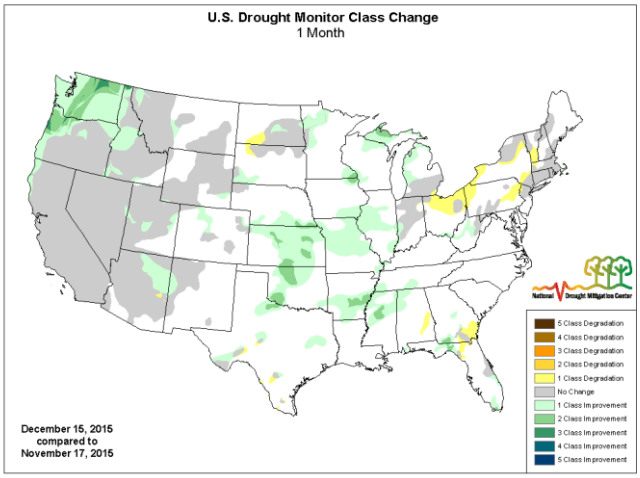
U.S. Drought Portal Comprehensive drought resource

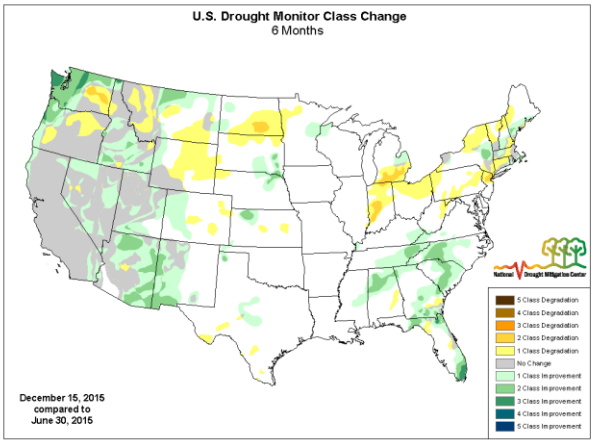
U.S. Drought Monitor See map below. Drought conditions continue in the West Coast states, including the exceptional drought in California and Nevada.

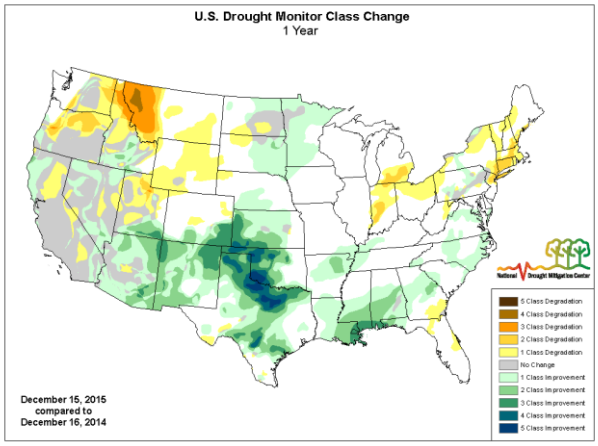


Changes in Drought Monitor Categories over Time



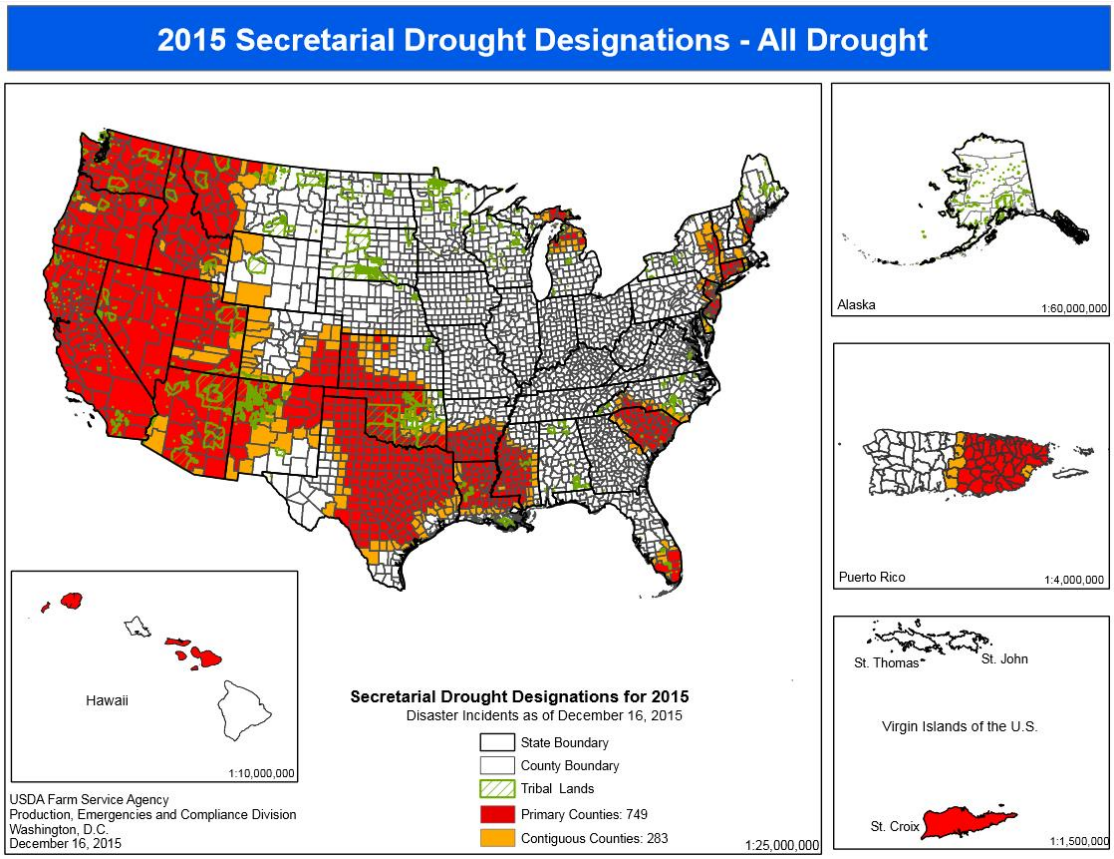






Drought conditions have improved in much of the country, especially in the south-central U.S. The West has shown some recent improvement, but long-term drought persists.

2015 USDA Drought Designations



Drought Designations as of December 9, 2015

USDA Disaster and Drought Information

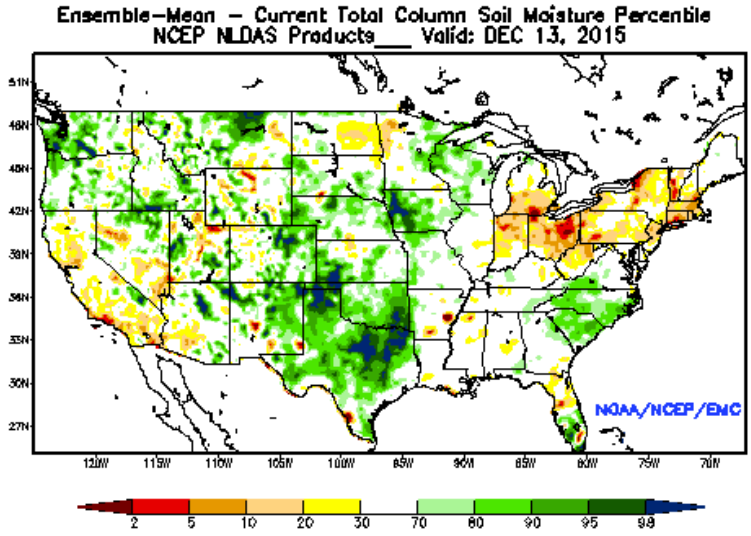
U.S. Population in Drought, Weekly Comparison

Highlighted Drought Resources

- Drought Impact Reporter
- Quarterly Regional Climate Impacts and Outlook
- U.S. Drought Portal Indicators and Monitoring

Other Climatic and Water Supply Indicators

Soil Moisture

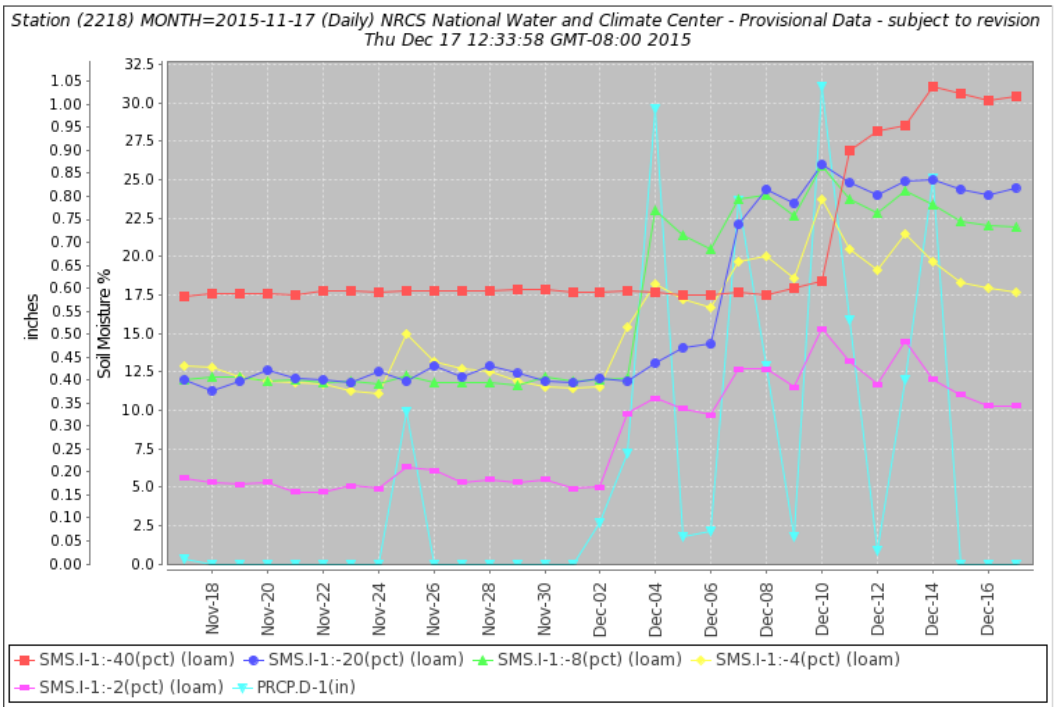


The modeled **soil moisture percentiles** as of December 5, 2015 show scattered areas of dryness in the far West, the Midwest, and Northeast.

Above average soil moisture was modeled in much of the interior West, Texas, and the Southeast. The areas with the wettest conditions were in the Carolinas and northeast Texas.

University of Washington Experimental Modeled Soil Moisture

Soil Moisture Data: NRCS Soil Climate Analysis Network (SCAN)



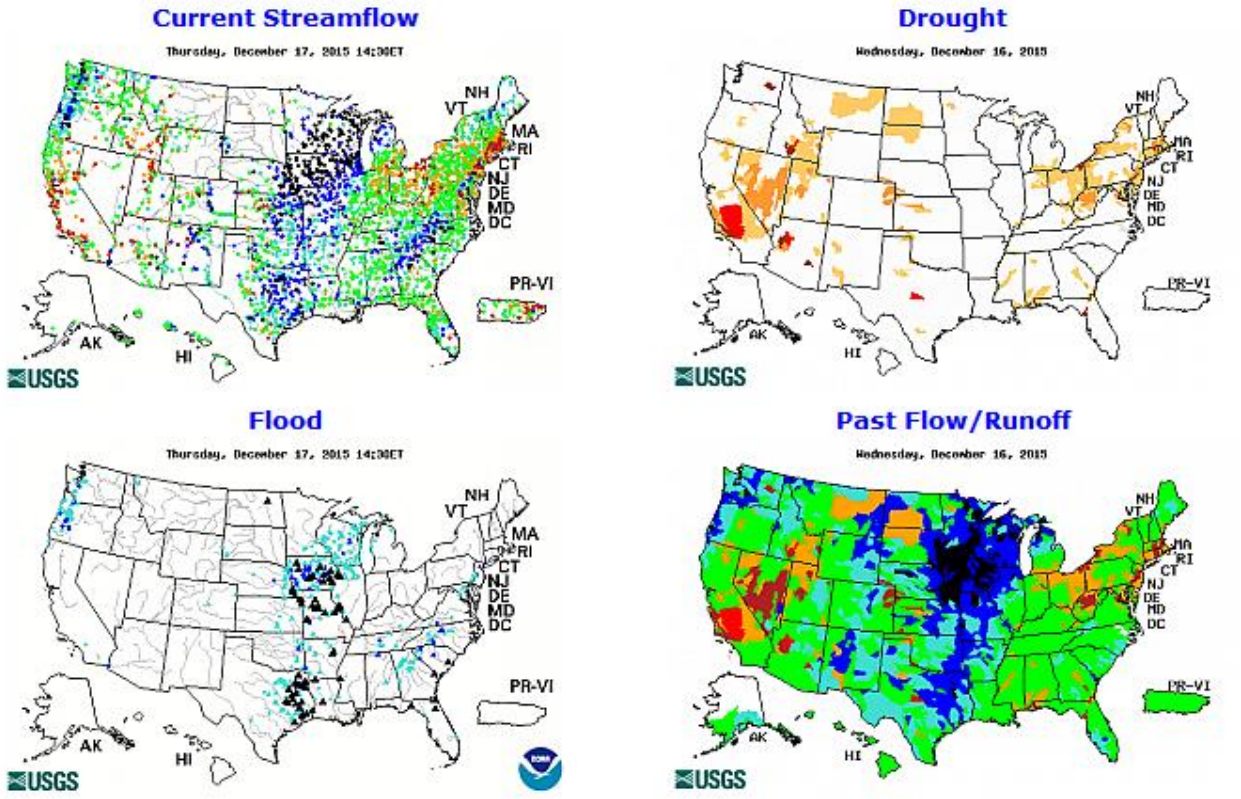
This graph shows soil moisture (at 2-, 4-, 8-, 20-, and 40-inch depths) and precipitation for the last 30 days at French Gulch (SCAN #2218) in northern California. Soil moisture response to precipitation events is noticeable at all depths for the recent series of large storm events.

Soil Moisture Data Portals

CRN Soil Moisture
Texas A&M University North American Soil Moisture Database

Streamflow

Source: USGS



Streamflow is notably high in the upper Midwest, lower Mississippi River Valley, and the Southeast. A large number of rivers in the central U.S. along the Mississippi River are above flood stage. Streams remain above flood stage in the Southeast.

Select any individual map to enlarge and display a legend.

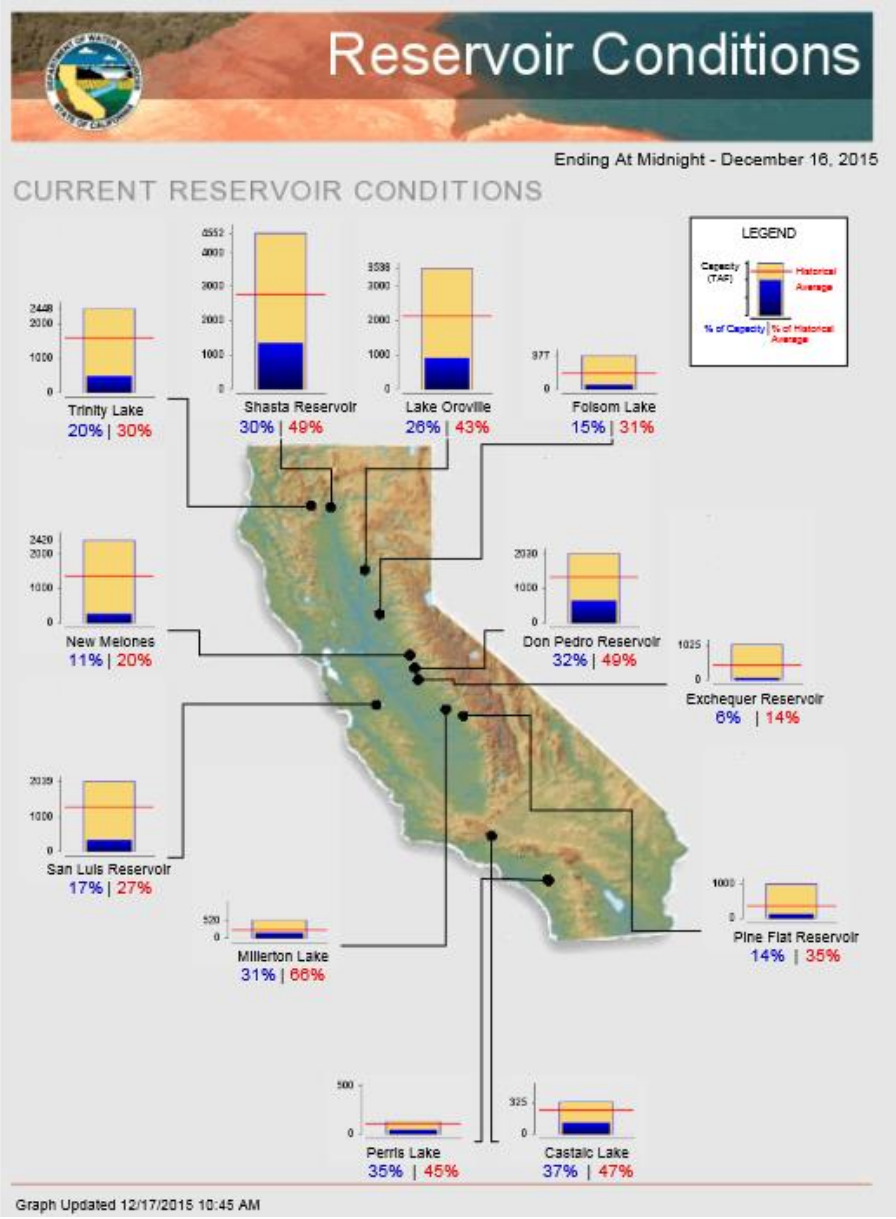
Current Reservoir Storage

National Water and Climate Center Reservoir Data

U.S. Bureau of Reclamation Hydromet Tea Cup Reservoir Depictions:

Upper Colorado
Pacific Northwest/Snake/Columbia
Sevier River Water, Utah
Upper Missouri, Kansas, Oklahoma, Texas

California Reservoir Conditions



Short- and Long-Range Outlooks

Agricultural Weather Highlights

Author: Brad Rippey, Agricultural Meteorologist, USDA/OCE/WAOB

National Outlook, December 10, 2015: "Rain will end tonight in much of the eastern U.S., with an additional 1 to 2 inches possible in some areas. Showers will linger into Friday, however, across Florida's peninsula. On December 17-18, a brief cold snap will lead to the development of snow squalls downwind of the Great Lakes. However, unusually warm weather will soon return to the central and eastern U.S. Meanwhile, a stormy regime will continue in the Northwest, with significant snow expected in the mountains. Five-day precipitation totals could reach 4 to 12 inches in the Pacific Northwest and 2 to 4 inches in the northern Rockies. Rain and high-elevation snow will spread as far south as northern California. Early next week, a pre-holiday storm system will begin to take shape across the eastern half of the U.S. The NWS 6- to 10-day outlook for December 22 – 26 calls for the likelihood of warmer-than-normal weather across the central and eastern U.S., while near-normal temperatures can be expected in the West. Mean-while, wetter-than-normal conditions across most of the country will contrast with below-normal precipitation in the lower Rio Grande Valley."

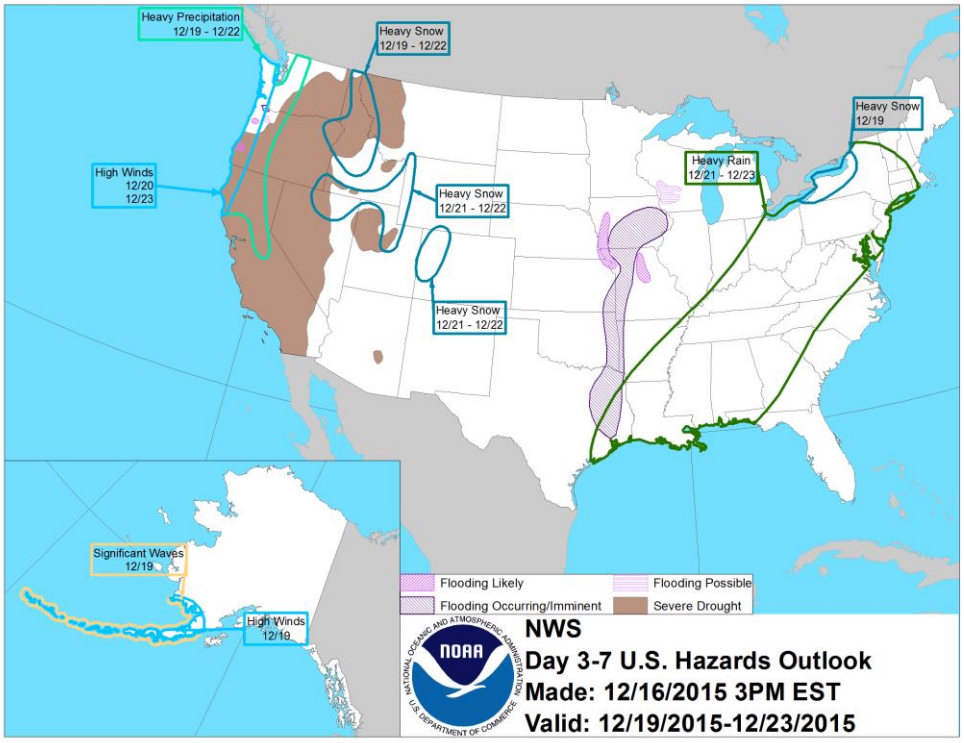
National Weather Hazards

The outlook for **weather hazards** over the next week includes heavy rain over most of the East with lake-effect snow in western New York.

Heavy snow is expected in the Rocky Mountains. Heavy precipitation and high winds are expected along much of the West Coast.

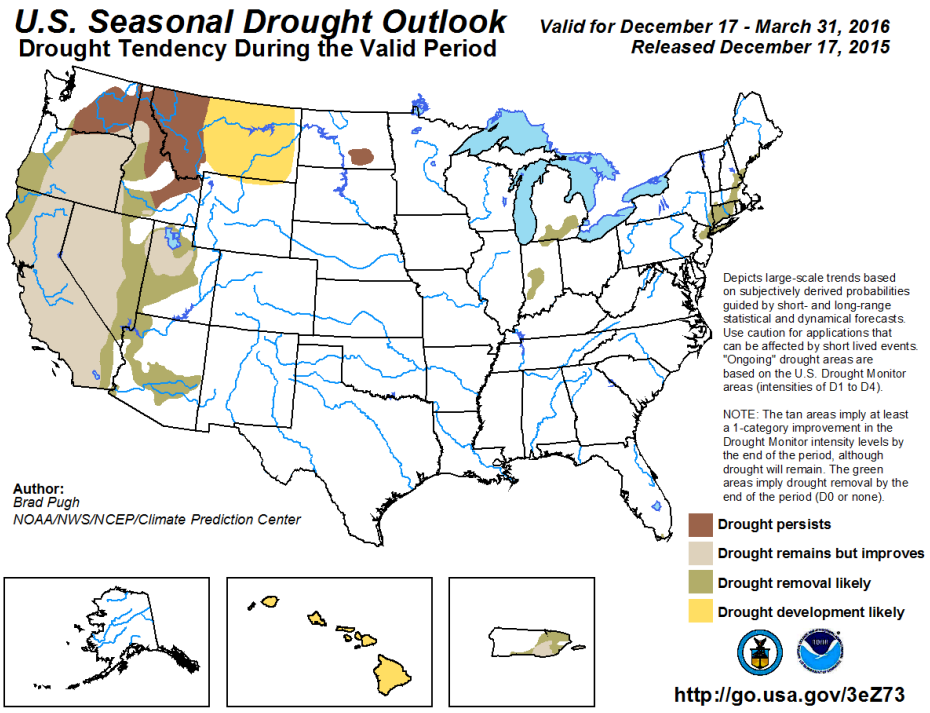
In Alaska, high winds and significant waves are expected along the Southwest coastal areas.

Flooding is occurring or likely in most of the Mississippi River basin, and in isolated spots in the Pacific Northwest. Severe drought covers a large area of the West.



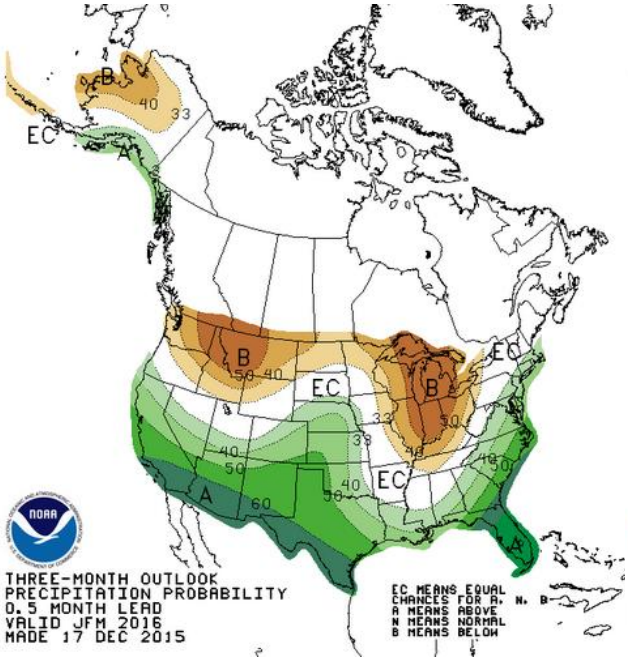
Seasonal Drought Outlook

During the next three months, **drought** will persist in the Northwest and may develop in eastern Montana, and Hawaii. Elsewhere, most drought designations are expected to improve.

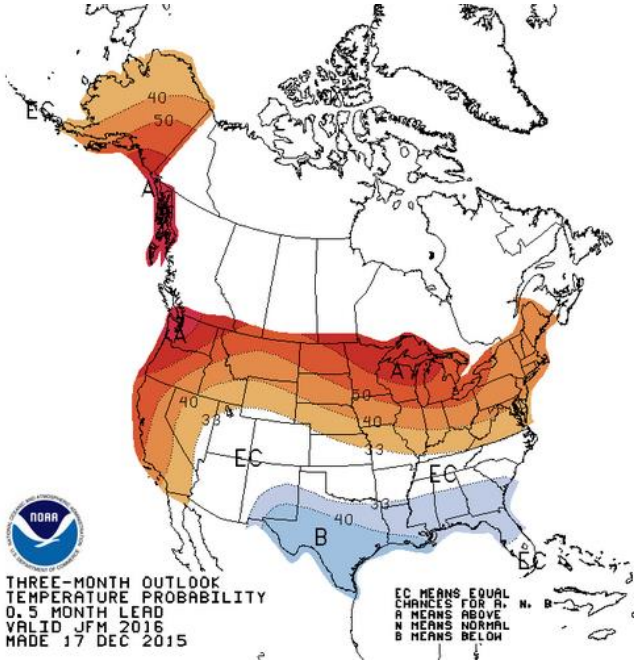


NWS Climate Prediction Center 3-Month Outlook

Precipitation



Temperature



Outlook Summary

NWS Climate Prediction Center:

"The December-January-February (DJF) 2015-2016 precipitation outlook indicates enhanced probabilities of above-median precipitation for California, the Southwest, the central and Southern Great Plains, the lower Mississippi Valley, and from the southeast North to southern New England. The probabilities are highest for above-median precipitation across southern California, the desert Southwest, West Texas, and Florida. Below-median precipitation amounts are most likely for parts of the Pacific Northwest, northern Rockies, and Great Lakes. A slight tilt in the odds for above (below)-median precipitation is forecast across southern coastal (western) Alaska."

"The December-January-February (DJF) 2015-2016 temperature outlook favors above-normal temperatures across the continental U.S., north of the 40th parallel, along with much of the western U.S. Above-normal temperatures are also favored for most of Alaska. The odds of above-normal temperatures are highest across the Pacific Northwest and upper great lakes where probabilities of above-normal temperatures exceed 60 percent. Increased chances for below-normal temperatures during JFM are forecast across parts of the south-central and southeastern U.S."

More Information

The NRCS **National Water and Climate Center** publishes this weekly report. We welcome your feedback. If you have questions or comments, please **contact us**.